Wilson BA, Robertson D, Moloney DJ, Newell GR and Laidlaw S (1990) Factors affecting small mammal distribution and abundance in the eastern Otway Ranges, Victoria. *Proceedings of the Ecological Society of Australia* **16**, 379-396.
Wilson BA and Friend GR (1999) Responses of Australian mammals to disturbance: A review. *Australian Mammalogy* **21**, 87-105.
Wilson BA, Aberton JG and Reichl T (2001) Effects of fragmented habitat and fire on the distribution and ecology of the swamp antechinus (*Antechinus minimus maritimus*) in the eastern Otways, Victoria. *Wildlife Research* **28**, 527-536.
Wilson BA, Dickman CR and Fletcher TP (2003) Dasyurid dilemmas: problems and solutions for conserving Australia's small carnivorous marsupials. In *Predators with Pouches. The biology of carnivorous marsupials*, pp 407-421. Eds ME Jones, CR Dickman and M Archer. (CSIRO Publishing: Australia)

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History of the FNCV Geology Group, 1880-2005

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Abstract
The history of the FNCV Geology Group from 1880 to 2005 is presented. This includes an account of the origins of the FNCV Geology Group, the geological activities in the early days and the competition with alternative geological forums for members. A case study is given of the involvement of Charles Brittlebank and the FNCV in the elucidation of the Bacchus Marsh glacial sediments. This paper provides detail of notable geological contributors to the FNCV such as TS Hall, Frederick Chapman, ED Gill, Tom Hart, Alf Baker, Jack Douglas, Neil Archbold and Noel Schleiger; it finishes with a description of recent activities of the group under the leadership of Rob Hamson. (*The Victorian Naturalist* **123** (2), 2006, 100-111)

Introduction

Geology as an area of study and recreation has been an integral part of the Field Naturalists Club of Victoria (FNCV)'s history since its foundation in 1880, although a separate geology group was not formed until 1946. This paper was written for the Club's 125th Anniversary celebrations in 2005 and does not attempt to be exhaustive. Reviews of the history of the Club have periodically been published in *The Victorian Naturalist* at key anniversary dates, i.e. 25th (Barnard 1906), 40th (Barnard 1920), 50th (Barnard 1930), 60th (Pescott 1940), 70th (Coghill *et al* 1950) and 100th (Willis *et al* 1980).

Along with Jim Willis's general review of the Club for the Centenary celebrations (Willis 1980) there was a review of the Geology Group by Edmund Gill (1980). Information on past geological activities can be obtained from this review and from an earlier review by Neil (1950). Further information can also be gleaned from the general reviews mentioned above as well as from the collective pages of *The Victorian Naturalist* itself.

Origins of the FNCV

During the 1870s and 1880s there was a noticeable groundswell in the desire for new cultural institutions in the burgeoning Colony of Victoria. The obvious reason for this was that there had been an abrupt increase in population and prosperity as a result of the gold rush of the 1850s. Victoria was flooded with people from Europe and Asia. As the population grew so did the people's demand for services, infrastructure and institutions similar to those available in their countries of origin. By the 1870s and 1880s income per capita in Victoria was one of the highest in the world. It was a period of great confidence and optimism, and of considerable vitality and innovation. Most of the new organisations were modelled on familiar existing British institutions.

In Victoria in the 1850s these developments initially led to the establishment of a range of societies across the intellectual spectrum. Some were more enduring than others. Scientific societies were formed, such as the Philosophical Society of Victoria and the Victorian Institute for the

Advancement of Science, both founded in 1854. In 1855 these two societies merged to form the Philosophical Institute of Victoria, which in turn became the Royal Society of Victoria in 1859. The Royal Society provided an intellectual forum for many of the early naturalists. Papers were presented and published, issues were debated, expeditions were organised, and specimens collected and exhibited. A specialist Geological Society of Victoria was established in October 1852 but had an ephemeral existence and had ceased functioning by the end of 1853.

By the 1880s the early pioneering exploration period was mostly over. Large areas of the continent had been traversed and a period of more intense examination of the geography and natural history had begun. Already a substantial body of scientific knowledge had accumulated and many natural history specimens had been collected. For those interested in natural history Victoria proved to be a fertile field for study and yielded much that was novel and fascinating. The early collections of William Blandowsky formed the basis for the founding of the National Museum of Victoria (precursor to the current Melbourne Museum) which was then rapidly developed under Frederick McCoy. As residential development proceeded and agriculture and mining was established, gross environmental changes were becoming evident. A desire to participate in studying, observing, collecting, and preserving Victoria's natural heritage were some of the motivations for forming a field naturalists club.

Some naturalists were of the opinion that what was needed was a more popular, accessible and sociable forum than that provided by the Royal Society of Victoria, which was perceived by them to be exclusive and formal, and which, at least at the organizational level, tended to be populated by professional scientists and academics. (Although, in principle, unlike the Royal Society of London, membership of the Royal Society of Victoria was open to all). It was against this background and the pervasive nineteenth century enthusiasm for natural history that the Field Naturalists' Club of Victoria came into being in May–June 1880. The new Club fulfilled a definite need and attracted a substantial membership and has since provided a base for the amateur naturalist over the last 125 years.

From its inception the range of interests and activities in the FNCV has been very broad, covering a wide variety of natural history topics such as botany, zoology, geology and their various sub-disciplines. In addition, there has been a sustained interest in conservation of natural resources. From the Club's beginnings to the present day geology has always been regarded as an important area of study.

Geological activities in the early days of the FNCV

With Frederick McCoy as the first President of the FNCV it would have been expected that geology and palaeontology would have had some priority in the Club's activities. McCoy was Professor of Natural Science at the University of Melbourne and lectured in geology and related subjects such as palaeontology, mineralogy and chemistry, and also in zoology, comparative anatomy and botany. He was also Government Palaeontologist and Director of the National Museum of Victoria. He served as President of the FNCV for three years from 1880 to 1883.

However, McCoy's direct influence on the Club's activities was not nearly as significant as one would have expected (Houghton 2001). McCoy was largely a figurehead for the Club and was happy to give his support and patronage but did not regularly attend any of the meetings or excursions, and appears to have had minimal input into the Club's activities. The only exception to this was his Presidential address at the Annual Conversazione. In his first Presidential Address (McCoy 1881) he argued that there needed to be more emphasis put on geological field work. He stated: 'It has been remarked that Geology had not had its fair share of attention from the members of the Club in their excursions, and yet there is a great deal of interesting geological observation and collecting to be done in the vicinity of the city, or within moderate excursion distance by rail, coach or steamer.'

McCoy went on to detail a number of geological formations and rocks within

easy reach of the city, including Tertiary and Silurian sedimentary rocks at Royal Park, Tertiary rocks at Flemington, Mornington and Geelong, 'a red flaggy bed full of beautifully preserved leaves ... near Bacchus Marsh', volcanic rocks such as basalt at Richmond and the Keilor Plains, and gem minerals in the Dandenong ranges. He concluded that: 'In fact the hands of geologists need be no more idle that those of other members of the Club, who certainly have hitherto left Satan but little for his mischief-making endeavours with such materials.' McCoy was quite correct, of course: Melbourne and surrounding districts contain some of the most interesting and diverse geological phenomena to be found anywhere (although whether this providential situation was because of the 'Creator's' beneficence and grace and personal concern for the progress of the FNCV and its members' as McCoy was suggesting is altogether another question).

It is noteworthy that there was a feeling by some members that geology had a lower priority than they would have regarded as ideal. An examination of the history of the FNCV over its 125 years indicates that botany and zoology have received much more attention than geology. This is perhaps reflected in the contributions of its early patrons, Frederick McCoy and Ferdinand von Mueller. Whereas McCoy published nothing of his palaeontological or geological work in the Club's journal *The Victorian Naturalist*, Mueller by contrast was an active and prolific contributor in his discipline of botany. With a mining and building boom in full swing and the creation of numerous quarries and excavations, the relative dearth of geological papers in the pages of the FNCV journal requires some explanation.

Competing forums

It is clear that there were several competing alternative forums for local geologists and geological enthusiasts to join and interact in and to discuss and to publish their work. The Royal Society of Victoria, in particular, appears to have been the preferred local venue for geologists, and many academic and professional geologists were ordinary members, council members and presidents. Another competing but also complementary forum was The Australasian Association for the Advance-ment of Science (AAAS, later ANZAAS) which began in 1888 and allowed access to serious amateurs as well as professional geologists. The AAAS conferences included a Geology and Mineralogy Section, and periodically specialist geology committees were set up.

In 1885 a Geological Society of Australasia was founded by Robert Litton (Branagan 1976). Litton initially intended it to be an amateur geological equivalent to the FNCV. Despite its more ambitious name it was essentially a Melbourne based organisation and therefore a direct competitor with the FNCV (Finney 1993). However, over time the Geological Society of Australasia evolved to attract the more career-oriented geologists such as James Stirling, Government Geologist of Victoria, Ralph Tate, Professor of Natural Science at the University of Adelaide, and TW Edgeworth David, Professor of Geology at the University of Sydney. On the one hand this tended to divert valuable potential professional members away from the FNCV, but on the other hand had little effect on the true amateurs who were more at home in the FNCV. The Geological Society of Australasia, while influential in its day, ceased functioning about 1907.

A Parting of the ways

To some extent the 1880s and 1890s in Australian science represented what Allen (1994: 158-174) referred to as 'a parting of the ways' between amateur and professional science. It was as discernible in the field of geology as in other natural history domains. This split was deepened with the establishment of specialist professional societies. One such geologically related professional body founded at this time was the Australasian Institute of Mining Engineers, which was established in 1893 in Adelaide, later named the Australasian Institute of Mining and Metallurgy (AusIMM). There were also the various Mining Departments and Geological Survey Organizations in each state. Professional geology in Australia in the late nineteenth century had come of age. There were a number of professional asso-

ciations catering for the career geologist. The demarcation between amateur and professional, which was far less evident prior to the 1880s, was now quite marked. Professional geologists and palaeontologists such as Frederick McCoy were now numerically in the minority in field naturalists clubs but their contributions were invaluable and always greatly appreciated by the membership (as they still are today). While naturalists with a geological bent did have the choice of a variety of appropriate clubs and organisations to choose from, often the only convenient option was the FNCV or a local field naturalist's club. The natural home of the amateur geologist was the FNCV alongside a now reduced number of semi-professional and professional career geologists. It has been this mix of amateurs and empathetic like-minded professionals, and the social interactions between them, that has provided the Club and its members with a high degree of competence, knowledge, creativity and energy. One aspect of this interaction is the invitation to the professional geologist to speak on a particular topic in which that person has expertise, to publish papers and to lead excursions. Likewise the competent amateur or semi-professional is able to carry out similar tasks depending on their particular proficiency.

The following case-study of Charles Brittlebank (Fig. 1) and the Bacchus Marsh glacial sediments gives one illustration of how this interaction between amateurs and professionals can work.

Charles Brittlebank and the Bacchus Marsh glacial sediments

Charles Clifton Brittlebank (1862-1945) (Fig. 1) was an early member of the FNCV and 'to his confrères, and earlier members of the Field Naturalists' Club, he was considered one of the most versatile and knowledgeable men of science...' (Pescott 1946: 189). Brittlebank was born in Winster, Derbyshire, and with his parents and brother the family migrated to Australia, first to Queensland, then Tasmania, subsequently settling in Victoria at Springvale and finally on a dairy farm in the Pentland Hills near Bacchus Marsh in 1893.

Fig. 1. Charles Brittlebank. *The Victorian Naturalist*, vol. 62, p. 189.

From childhood Brittlebank had a deep and abiding interest in natural history. Initially his focus was on geology and ornithology but later his interests broadened to encompass entomology, botany and plant pathology. In 1913 he was appointed Government Plant Pathologist. He was also a gifted natural history artist and illustrated many texts and papers including Charles French's *Destructive Insects of Victoria* and AJ Campbell's *Nests and Eggs of Australian Birds*. In addition to his other duties he lectured on plant pathology at the School of Horticulture at Burnley and at the School of Agriculture at the University of Melbourne. In 1924 he became Biologist in charge of the Science Branch of the Department of Agriculture, retiring in 1928.

Field trips and excursions have always been a fundamental activity of the FNCV. One of the early field trips in which Brittlebank acted as the local guide is particularly notable (see below). It will be quoted in some detail because apart from its relevant content for this case study it illustrates a typical FNCV (geology) excursion in the late nineteenth century. The excursion was led by AJ Campbell with George Sweet as geological commentator. Following is Campbell's report from *The Victorian Naturalist* (Vol. 8, November 1891, pp. 99-100).

The Werribee Gorge Excursion
3rd October, 1891

For this most interesting locality only five members put in an appearance at the *rendezvous*. If that small number represents the vitality of a club with some 200 members – well, perhaps, the least said about it the better. At all events, 14 or 15 names were handed in for the excursion, which warranted the co-leaders in ordering breakfast beforehand, at Bacchus Marsh, for at least a dozen. You should have seen the faces of the landlady and her dutiful daughters when only 5 put in an appearance! Then it was fun to witness some of the coach horses whipped home in disgust. Two extra conveyances were brought in seven or eight miles in anticipation of the names furnished, and had to return empty. Moreover, the good mother of one of our co-leaders, at Myrniong, had prepared a sumptuous evening repast for the full number of 15 – a fitting termination for the day's work – but only the 5 beforementioned, *plus* 3 local members, turned up; and be it said to their credit, well did they endeavour to do justice for the 15. Now, all this is very disappointing of course for those members who remained at home. However, some sent written excuses on account of sickness – probably the remainder were delayed through the *appearance* of rain. Surely their ardour is easily damped. Rain did fall on the Friday evening, and such refreshing rain that the local farmers said they would have rather seen the much-needed moisture than a whole cloud of naturalists. As it was the Saturday turned out most delightfully fine, one slight shower only fell about 4 o'clock, therefore none of the party got wet except one member, who fell into the river.

The five members who left town were Messrs. De Le Souëf, G. Sweet, J. Ashworth, A. J. Campbell, and E. H. Hennell, who were joined at Myrniong by three local members, Messrs. C. and T. Brittlebank and J. Lidgett. The gorge was entered about 11 o'clock, and by late in the afternoon its whole length was traversed and some tributary gullies explored. The scramble among such romantic surroundings was fully enjoyed by the party, with the varying scenes of native grandeur opening up at every bend. Here was a cliff of slate rock 200 feet high, with a miniature cascade at its foot; there, blocking up and turning the river's course a pyramidal crowned hill about 400 feet in height, where trees and scrub cling on amongst their rocky environments. And so on till the greatest elevation – 600 feet – is attained above the river's bed, forming a singularly beautiful vista, the steep hill side being fairly clothed with timber and capped with a pile of naked rocks, now known as the Falcon's Lookout.

Some photographs were taken with excellent effect, especially of the scene last mentioned, also pictures were taken of an eagle's aerie, a nesting tree of the Boobook Owl, and the nest *in situ* of a Sericornis cunningly cleft in a mossy bank. But it was observed by those who had visited the locality before that the destructive flood of last August had wrought great havoc with some of the most beauteous portions of the gorge, especially near the river. Some of the scenes depicted at the Club's last *conversazione* have been entirely obliterated. Judging by the former great flood (1863) it will be nearly 30 years before the river banks will be so beautifully margined with stately trees and shrubs. That is, of course, provided no other destroying flood occurs in the interim.

Birds were scarce compared with those observed by a contingent of Mr. Keartland's Melton excursion that visited the Werribee Gorge exactly this time last season. Six or seven species of orchids were noticed flowering. About the same number of ferns were seen. Many of the ironbarks and box-trees were in bloom; while the river's banks were adorned with several showy shrubs in flower.

Some instructive geological notes bearing upon the locality, and remarks upon impressions of leaves and fruits, will be probably offered by Mr Sweet on another occasion.

A. J. C.

In the report of the ordinary monthly meeting of the Club held in the Royal Society's Hall on 14th December (*The Victorian Naturalist* January 1892: 132) under the heading 'Exhibition of Specimens' it was noted, as follows, that some pebbles were exhibited by George Sweet:

> By Mr. G. Sweet. – Pebbles, probably glaciated, from Myrniong.

This fleeting reference and the similarly brief one at the end of the Werribee Gorge excursion report (above) would hardly alert

the naive reader that something of great importance had been found and furthermore that its significance had been fully appreciated by the parties involved. However, this is the essence of the claim later made by Brittlebank upon the publication of a paper in the *Proceedings of the Royal Society of Victoria* by two of Frederick McCoy's students at Melbourne University, Graham Officer and Lewis Balfour.

Officer and Balfour's paper titled 'Preliminary Account of the Glacial Deposits of Bacchus Marsh' was read before the Royal Society on 14 July 1892 and published in the Society's *Proceedings* of 1893. Officer and Balfour first visited the Bacchus Marsh district in June 1892 and prior to their second visit made contact with Charles Brittlebank. In the paper they acknowledged help given to them in their researches by Brittlebank as follows:

> Before making our next visit to the locality, we wrote to Mr. Charles Brittlebank, of Dunbar farm, near Myrniong who, we were led to believe, could give us information in our researches. Mr. Brittlebank readily responded, and during our subsequent visits has rendered us much valuable aid. He has accompanied us on most of our expeditions and shown us much hospitality, while his intimate knowledge of the locality, as well as his keen powers of observation have been of the greatest assistance to us. Mr. Brittlebank informs us that he found glaciated stones in this district four years ago. He thus appears to have been the first to actually prove the glacial origin of the deposits in question.

In fact, the claim that Brittlebank was the first to prove the glacial origin of certain rocks at Bacchus Marsh is not strictly correct. Even though he contributed a great deal to their elucidation and came to know them better than anyone else, there were others who preceded him in suggesting and demonstrating that they were glacial in origin (see Archbold 1998).

Previous workers on the Bacchus Marsh glacials

Alfred Selwyn (1861) was the first to speculate that the Bacchus Marsh sediments were 'very suggestive of the results likely to be produced by marine glacial transport' although he also noted that 'grooved or ice-scratched pebbles or rock fragments' had 'not yet been observed'. However, at the time there was a major international debate on the validity of claims about the glacial origin of some fairly recent (Pleistocene) rocks. After several decades of debate a consensus was emerging and the concept of an 'Ice age' was only just becoming accepted by northern hemisphere geologists. The rocks in question at Bacchus Marsh were known to be much older, perhaps as much as 200 to 300 million years or more. To suggest that there had been another earlier Ice age several hundred million years before the recently accepted Pleistocene one seemed to be stretching credibility.

Richard Daintree (1866: 11) reported that from 'mud-pebble beds, on the Lerderderg River' he had 'found a few pebbles grooved in the manner I have read of as caused by glacial action'. In 1889 EJ Dunn visited the Bacchus Marsh area and stated unequivocally that 'the forms of the included materials and the striatures and grooves on their surfaces prove that this conglomerate is of glacial origin' (Dunn, 1889: 81; *see also* Archbold 1998). Similarly, WH Ferguson (1891:32) reported on the 'glacial conglomerate' and stones that were 'striated, the result of ancient glacial action'. All of these reports were essentially internal reports with limited circulation, and seemed to have been somewhat overlooked by contemporary and later commentators. However, Officer and Balfour's paper published in the *Proceedings of the Royal Society of Victoria* did receive wide circulation, and despite the authors giving what they thought at the time was due and ample acknowledgement to Brittlebank for his assistance (see above) Brittlebank reacted critically and forcefully to their publication.

Priority Dispute

At the Adelaide meeting of the Australasian Association for the Advancement of Science, held in September 1893, George Sweet presented a paper titled 'Glacial Deposits of Bacchus Marsh' which was highly critical of Officer and Balfour's work. The paper implied that Officer and Balfour had intruded into an area of their own (i.e. Brittlebank and Sweet's) research and had

published carelessly and with undue haste. Sweet claimed that ever since the Field Naturalists excursion to Werribee Gorge in October 1891, when he and Brittlebank first met, they had intended publishing their work.

> We then commenced and have since continued working together, with the intention of making the results of our investigations known at as early a date as possible, and as much was hinted at by the leader of the excursion above referred to in his report to the Field Naturalists' Club. We soon found, however, that the subject and the locality were such that they could not be fairly dealt with in a hurry, and we concluded that it was better to delay publication than give utterance before we had digested all the more relevant facts. However, we communicated to such fellow workers as we came in contact with the results of our work; for instance, to Professor R. Tate, in January, 1892, and one of us exhibited several of the striated pebbles at the Field Naturalists' meeting in the same month (Sweet and Brittlebank 1894: 376-377).

Officer and Balfour, who were absent from the Adelaide AAAS conference and clearly staggered by the criticism, were later able to defend themselves at the next AAAS conference in 1895. They were adamant that when they first visited Bacchus Marsh,

> we had not the slightest idea that anyone else was working in the same field, the latest reference to the glacial beds that we knew of being that of Mr. Dunn. Subsequently on our second visit we were introduced to Mr. Brittlebank, and learned for the first time that Mr. Sweet had been in the district before us. Neither of us were acquainted with Mr. Sweet; and Mr. Brittlebank, though we informed him of the object of our visit, never gave us the slightest hint that they were working together with a view to publishing the results of their observations. (Officer and Balfour 1896: 322).

Despite the pleading by Officer and Balfour that they were innocent of the charge of deliberately 'trespassing on a prior claim' and that Brittlebank 'had given us no intimation of any desire to publish anything on the subject' (Officer and Balfour 1896: 323), Brittlebank and Sweet would have none of it. At the 1898 Sydney AAAS meeting they stated bluntly that 'they have to take exception to some remarks made by Messrs. Officer and Balfour, at the Brisbane meeting of the Association.' and that they 'would point out that the statements made by them [Brittlebank and Sweet] at the Adelaide meeting are true in substance and in fact.' (Brittlebank *et al* 1899: 365).

International acceptance of a late Palaeozoic ice age

Brittlebank and Sweet's claims of priority were all but sanctified when they gained support for their work from Professor Edgeworth David, whose Presidential Address at the 1895 Brisbane AAAS conference was on glacial action in Australia. David put his name to the paper quoted above (Brittlebank *et al* 1899) in which Officer and Balfour were criticised. David's presentation on the Late Palaeozoic Australian glaciation to the Geological Society of London and the corresponding publication in the Society's Journal in 1896 signifies the general acceptance by the geological community of a vast Southern Hemisphere glaciation. As noted by David Branagan (1999: 333), JE Marr in his Presidential Address to the British Association in 1896 stated unreservedly 'as a result of the masterly resume of Professor Edgeworth David the bulk of British geologists are prepared to admit that there has been more than one glacial period, and that the evidence of glacial conditions in the southern hemisphere in Permo-Caboniferous times is established.'

By the late 1890s the Bacchus Marsh glacial sediments were receiving world attention, and Brittlebank and Sweet were now recognised as having produced the first material evidence for this (e.g. see Pritchard 1914). Contributors such as Daintree, Dunn, Ferguson and Officer and Balfour were generally overlooked. Brittlebank, who was essentially an amateur geologist, because of his assertiveness had succeeded in gaining credit for his contribution over more qualified professional geologists.

This case study highlights one of the strengths of field naturalists clubs in that an amateur naturalist can make important contributions to knowledge at many different levels and receive international recognition.

Notable geological contributors to the FNCV

In a review as brief as this it is not possible to give adequate credit to the legion of geological contributors to the FNCV. Many individual amateur and professional geologists have contributed in a variety of ways, for example, by organising and leading excursions, giving talks, writing papers, collecting, identifying and displaying specimens, preparing newsletters, sharing their experience and knowledge and encouraging others, or simply attending meetings. Some of these individuals have been identified in previous surveys (e.g. Gill 1980). Following are some brief comments on a selection of some of these outstanding figures.

Alfred William Howitt

Like Frederick McCoy, already mentioned, AW Howitt (1830-1908) achieved international recognition for his multi-disciplinary contributions to natural history. In Howitt's case his considerable talents spanned three major disciplines: geology, botany and anthropology. He was also a skilled bushman and in 1861 rescued John King of the Victorian Exploring Expedition (Burke and Wills expedition). Several months later he returned to Cooper's Creek on a second mission and collected the remains of Burke and Wills and carried them back to Melbourne for burial. Much of his early scientific work was done in virtual isolation when he was Police Magistrate and Warden of the Goldfields in Gippsland. The region that he supervised stretched all the way from Wilson's Promontory to Cape Howe. Each year he travelled thousands of miles on horseback and in the course of his normal duties made extensive geological and botanical observations. He published six papers in *The Victorian Naturalist* (however, only one was on geology).

James Stirling

Another notable geologist who lived and worked in Gippsland was James Stirling (1852-1909). He succeeded RAF Murray as Government Geologist in 1897. Stirling was responsible for the opening up of the black coal deposits in the Wonthaggi district and also reported on the Gippsland brown coal. Like many naturalists of his day he was proficient in several fields of natural history. He published just one article in *The Victorian Naturalist* (on botany) titled 'Notes on the Flora of Mount Hotham'.

Thomas Sergeant Hall

TS Hall (1858-1915) (Fig. 2) was born in Geelong and was a student at Melbourne University under both Frederick McCoy and Baldwin Spencer. He taught at Girton College in Bendigo, was director of the Castlemaine School of Mines, lectured in biology at The University of Melbourne, and later with GB Pritchard filled in for McCoy during his illness until the arrival of JW Gregory. One of the most capable palaeontologists ever to work in Victoria, his success in unravelling the local Ordovician graptolites sequence and his labours on Tertiary stratigraphy led to international recognition. Active in a number of forums including the Royal Society of Victoria and the AAAS, Hall joined the FNCV in 1888 and was President from 1901 to 1903. He was the first major geologist to fully dedicate himself to promoting the FNCV, publishing some 40 articles on a range of topics in *The Victorian Naturalist*. In 1909 he published the popular book *Victorian Hill and Dale*.

Fig. 2. Thomas Sergeant Hall. *The Victorian Naturalist*. vol. 32. p. 129.

George Baxter Pritchard

GB Pritchard (1869-1956) was a student of Frederick McCoy and collaborator with TS Hall on the stratigraphy of the Victorian

Tertiary. He worked briefly with Ralph Tate at the University of Adelaide before becoming a lecturer in metallurgy and assaying at the Working Man's College (later RMIT). His broad palaeontological concerns included a special interest in molluscs. He also collaborated with JH Gatliff on living molluscs. Prichard was an active member of the FNCV and published a number of short papers and excursion reports in *The Victorian Naturalist*. In 1910 he published *The Geology of Melbourne*.

John Dennant

An early contributor, John Dennant was a school inspector at Hamilton, and in collaboration with Ralph Tate worked on the rich deposits of Tertiary fossils at Muddy Creek and Grange Burn (west of Hamilton), in particular on bivalve molluscs and corals. Beginning in 1885 he published a significant serial article on the geology of south-west Victoria in *The Victorian Naturalist*.

Albert Ernest Kitson

One of the most distinguished early members was AE Kitson (1868-1937), who spent many years as a 'fifth class' clerk in the Victorian Public Service, first at the General Post Office, then the Lands Department and finally at the Geological Survey. He took a keen interest in geology, and while working in the Public Service pursued part-time studies in geology and mining. During this period he published a number of articles on a variety of topics in *The Victorian Naturalist*. In 1906 he was appointed head of the mineral survey of the Nigerian coast, and in 1915 became Director of the Gold Coast Geological Survey. He also helped set up the Geological Survey of Kenya. He was knighted in 1927.

Edmund Oswald Teale (aka **Thiele**)

EO Teale (1874-1971) followed a nearly parallel career path to that of AE Kitson in that he was also an employee of the Geological Survey of Victoria who gained a post in Africa. He served as Director of the Geological Survey of Tanganyika and as a mining consultant to the Tanganyika government from 1926 to 1940. Also like Kitson, he was a member of the FNCV and published a series of brief notes in *The Victorian Naturalist*.

Frederick Chapman

One of the most prolific geological contributors to the FNCV was Frederick Chapman (1864-1943) who published some 108 papers in *The Victorian Naturalist*. He was a world authority on the foraminifera. Chapman has sometimes attracted criticism for the accuracy of his work, but in his defence, as the first specialist palaeontologist at the National Museum he had the almost impossible job of describing fossils in the large collections of the Geological Survey of Victoria and at the University of Melbourne, which were transferred to the Museum. In 1927 he was appointed to an equally demanding job of the first Commonwealth palaeontologist.

Irene Crespin

Assistant to Frederick Chapman, and later his successor as Commonwealth palaeontologist, Irene Crespin (1896-1980) was also an expert in the foraminifera. She published just one article in *The Victorian Naturalist*, a report on an excursion to Green Gully.

Thomas Steven Hart

Teacher and lecturer in various Victorian schools and Professor of Geology at the Ballarat School of Mines, TS Hart (1871-1960) contributed 51 articles and excursion reports to *The Victorian Naturalist*, mainly on geology and botany. Hart had an extraordinarily broad encyclopaedic grasp of general knowledge and natural history. He was a lifelong contributor to the FNCV.

Daniel James Mahony

Links between the FNCV and the Melbourne Museum (formerly National Museum) have always been strong. DJ Mahoney (1878-1944), who studied geology under JW Gregory and EW Skeats, wrote several articles for *The Victorian Naturalist* in his younger days, and in 1931 became director of the Museum. He encouraged cooperation between the museum staff and amateur naturalists and established a policy of using honorary staff to assist the museum curators in their work.

Edmund Dwen Gill

The museum connection was further enhanced when ED Gill (1908-1986) became Curator of Fossils at the National

Museum and eventually Deputy Director. He was a dedicated supporter of the FNCV, contributing over 70 articles on a variety of geological and palaeontological topics to *The Victorian Naturalist*.

Alfred A Baker

In 1946 three specialist discussion groups were established, one of which was the Geology Group led by AA Baker. He remained secretary of the Geology Group for many years and was FNCV President 1953-1955. Baker contributed 16 articles to *The Victorian Naturalist*. The Geology Group has remained a viable active group for most of the time since its foundation as a specialist group.

John [Jack] Gordon Douglas

A long-time member and president of the FNCV 1986-1988, geologist and palaeobotanist Jack Douglas (b. 1929) has been a generous contributor to the Geology Group. His book *What fossil plant is that?* (Douglas 1983) has been a handy reference. In 1992 when the FNCV as a whole experienced some difficulties, and the Geology Group briefly ceased regular meetings, Jack Douglas agreed to act as chairman and from that time the group has generally functioned very well.

Neil Wilfred Archbold

Over the years the Geology Group has been assisted by a number of eminent professional geologists and palaeontologists. Neil Archbold (1950-2005) originally taught regular CAE courses in geology, which inspired several members to take up an interest in geology and fossils and join the FNCV. A noted brachiopod expert, he also made contributions to the history of geology and palaeontology. As Professor of Palaeontology at Deakin University he gave frequent talks, led excursions and was a steadfast supporter of the Geology Group, encouraging postgraduate students to participate in meetings and publish in *The Victorian Naturalist*.

Noel William Schleiger

One of the most committed FNCV members since joining in the late 1980s, Noel Schleiger (b. 1926) has been a major contributor to Geology Group activities. He has lectured, led excursions, published articles on geological topics and injected enthusiasm and energy into the group. His book *Roadside Geology: Melbourne to Ballarat* (Schleiger 1995), in particular, is an attractive and useful guide.

Other Contributions

Many other professional and distinguished amateur geological contributors could have (and should have) been mentioned. Lack of space and in a few cases lack of information prevents further detailed descriptions. Some of the earlier figures who made geological contributions to varying degrees include RW Armytage, W Baragwanath, FS Colliver, AW Cresswell, CJ Gabriel, JH Gatliff, HJ Grayson, JT Jutson, RA Keble, SR Mitchell, WJ Parr, AL Scott. No doubt there are many others worthy of mention who have been overlooked.

Recent contributions have been made by many professional geologists such as Ken Bell, Bill Birch, Eric Bird, Phil Bock, Dermot Henry, Bruce Hobbs, Julian Hollis, Bernie Joyce, Graham Love, Roger Pierson, Ian Plimer, Stan Rowe and Alan White. Considerable contributions also have been made by many serious amateurs such as Lyn Ansell, Clem Earp, Rob Hamson, Doug Harper, Frank Holmes, Dan McInnes, Ray Power and John Stewart.

The Geology Group since its sormation in 1946

Except for a few brief vacant periods in the 1990s, the Geology Group has been fortunate to have had a number of dedicated long-serving Group Secretaries, beginning in 1946 with Alf Baker who headed the group until around 1960. He was followed by RR Dodds (1960-1965), R Box (1966-1967), Tom Sault (1968-1983) and Helen Bartoszewicz (1984-1991).

Numbers were boosted when in the early 1990s the Adult Education Association (AEA) Geology Group ceased operating and most of the members transferred to the FNCV. Members such as John Spencer and Noel Brown have regularly attended the FNCV Geology Group meetings since that time.

In the early 1990s the FNCV suffered some organizational and accommodation problems and the Geology Group briefly ceased having regular meetings. Following

that short interruption there was a return to business as usual and meetings were resumed with the support of Jaek Douglas. Graham Love took over as Secretary in 1992, followed by Karina Bader (1993-1994) then Doug Harper (1994-1998).

Recent Progress

In 1998 there was another brief break in the succession. A committee was formed, assisted by Clem Earp, and since 1998 a stable period has ensued with Rob Hamson as Secretary. Attendances over recent years have been very healthy, averaging between 25 to 30 persons per meeting. The frequency of geological excursions, which declined markedly in the early 1990s, now averages about six per year, a comfortable number. Rob Hamson has been an extremely able and diligent organiser and the Group has prospered under his stewardship.

In February 2005 a Committee was established to assist with the running of the Group. The five members elected were Rob Hamson, Noel Schleiger, Ray Power, Clem Earp and Lyn Ansell.

The quality of the monthly presentations has been excellent, as can be seen from the reports in the *Field Nats News*. All of this is good news for the present and bodes well for the future. Although there is a lack of teaching of geology in schools at present, members of the public can still come along and join an accessible and friendly community-based group and share in the 'geological experience'.

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References

Allen DA (1994) *The Naturalist in Britain: a Social History*. 2 ed (Princeton University Press: Princeton, New Jersey)

Archbold NW (1998) History of Geological and Palaeontological Studies on the Permian Glacially Derived Sequences of the Bacchus Marsh District, Victoria, Australia. *Proceedings of the Royal Society of Victoria* **110** (1/2), 31-43.

Barnard FGA (1906) The First Quarter of a Century of the Field Naturalists' Club of Victoria. *The Victorian Naturalist* **23**, 63-77.

Barnard FGA (1920) The Field Naturalists' Club of Victoria. 1905-20: A Retrospect. *The Victorian Naturalist* **37**, 71-78.

Barnard FGA (1930) The Field Naturalists' Club of Victoria, 1920-30. *The Victorian Naturalist* **47**, 39-50.

Branagan DF (1976) The Geological Society of Australasia 1885-1907. *Journal of the Geological Society of Australia* **23**, 169-182.

Branagan DF (1999) Antipodean Ice Ages. *Ecologae Geologicae Helvetiae* **92**, 327-338.

Brittlebank CC, Sweet G and David TWE (1898) Further Evidence as to the Glacial Action in the Bacchus Marsh District, Victoria. *Report of the Seventh Meeting of the Australasian Association for the Advancement of Science* **7**, 361-365, pls 17,18.

Campbell AJ (1900) *Nests and Eggs of Australian Birds: including the geographical distribution of the species and popular observations thereon*. (Pawson and Brailsford: Shellfield)

Campbell AJ (1891) The Werribee Gorge Excursion, 3rd October, 1891. *The Victorian Naturalist* **8**, 99-100.

Coghill G *et al* (1950) Proceedings [70th Anniversary Meeting]. *The Victorian Naturalist* **67**, 61-76.

Daintree R (1866) Report on the geology of the District of Ballan, including remarks on the age and origin of gold, etc. *Parliament of Victoria, Legislative Assembly, Parliamentary Papers* 1866, Vol. 2, **15**, 1-11.

David TWE 1896 Evidence of Glacial Action in Australia in Permo-Carboniferous Time. *Quarterly Journal of the Geological Society of London* **52**, 289-301, pl 12.

Douglas JG (1983) *What Fossil Plant is That?: a Guide to the Ancient Floras of Victoria*. (FNCV: Blackburn, Victoria)

Dunn EJ (1889) Report on alleged coal seams at Bacchus Marsh. *Reports of the Mining Registrars for the Quarter ended 30 September, 1888*, 80-81. (Government Printer: Melbourne)

Ferguson WH (1891) Report on the rocks and fossils at Bacchus Marsh. *Reports and Statistics of the Mining Department for the Quarter ended 30 June 1891*, 31-32, 1pl. of sections. (Government Printer: Melbourne)

Finney CM (1993) *Paradise Revealed: Natural History in nineteenth-century Australia* (Museum of Victoria: Melbourne)

French C (1891-1911) *A handbook of the Destructive Insects of Victoria: with notes on the methods to be adopted to check and extirpate them*. Prepared by Order of the Victorian Department of Agriculture. 5 Vols. (Government Printer: Melbourne)

Gill ED (1980) Contributions to science by early geologists of FNCV. *The Victorian Naturalist* **97**, 107-113.

Hall TS (1909) *Victorian Hill and Dale: a Series of Geological Rambles*. (TC Lothian: Melbourne)

Houghton S (2001) Frederick McCoy and the FNCV. *The Victorian Naturalist* **118**, 314-318.

Marr JE (1896) Presidential Address to the Geological Section of the British Association for the Advancement of Science, Liverpool. (Spottiswoode: London)

McCoy F (1881) Presidents Address. *Southern Science Record* **1**, 102-107.

Neil L (1950) Past Geologists of the Club. *The Victorian Naturalist* **67**, 63-65.

Officer G and Balfour L (1893) Preliminary Account of the glacial deposits of Bacchus Marsh. *Proceedings of the Royal Society of Victoria*, new series **5**, 45-68, pls 10-12; Discussion 262-275.

Officer G and Balfour L (1896) The Glacial Deposits of Bacchus Marsh. *Report of the Sixth Meeting of the Australasian Association for the Advancement of Science* **6**, 321-323.

Pescott EE (1940) Sixty Years of Work. The Story of the Field Naturalists' Club of Victoria, Year by Year. *The Victorian Naturalist* **57**, 4-31.

Pescott EE (1946) The Late Charles C. Brittlebank. *The Victorian Naturalist* **62**, 189-191.

Pritchard GB (1910) *The Geology of Melbourne* (Peter G. Tait: Melbourne).
Pritchard GB (1914) Notes on the Geology of the Bacchus Marsh District. In *Handbook to Victoria. British Association for the Advancement of Science Australian Meeting 1914*. Eds AM Laughton and TS Hall, pp. 1-2 (Government Printer: Melbourne)
Selwyn ARC (1861) Geology of the Colony of Victoria. In *Catalogue of the Victorian Exhibition 1961, with prefatory Essays, indicating the Progress, Resources, and Physical characteristics of the Colony*. pp. 175-191 (Government Printer, Melbourne)
Schleiger NW (1995) *Roadside Geology: a drive of discovery, a trip through time, an explanation of landscape and underlying geological structure: Melbourne to Ballarat* (GSA Vic Division and FNCV: Blackburn, Victoria)
Sweet G and Brittlebank CC (1894) The glacial deposits of the Bacchus Marsh District. *Report of the Fifth Meeting of the Australasian Association for the Advancement of Science* **5**, 376-389, pls 12-13.
Willis JH (1980) The First Century of the Field Naturalists Club of Victoria. *The Victorian Naturalist* **97**, 93-106.

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Ellen Margery McCulloch OAM

23 April 1930 - 13 November 2005

Ellen Margery McCulloch (née O'Neill) who died on 13 November 2005, aged 75, was born on 23 April 1930. She was awarded the Australian Natural History Medallion in 1990, in recognition of her dedicated and tireless efforts for conservation of the environment, relating particularly to birds – a well-deserved reward.

Ellen's interest in birds commenced during walks to and from school in Kallista. It was an interest she never lost. Many years later, when she attended Jack Hyett's lectures at the Council of Adult Education (CAE), she realised that bird-watching, and all that it involved, was the recreation she most wanted to pursue. From then on she led a life of ceaseless activity. Despite having two small daughters, and home cares, she found time to involve herself more and more in the world of natural history. When she felt she was competent enough she also became a lecturer for the CAE. She also enjoyed cricket, music and spinning.

She joined Bird Observers Club of Australia (BOCA) in 1963 and held secretarial positions in that organisation for more than ten years. However, she really came into her own when she was appointed as the Club's Public Relations Officer. In this capacity she was responsible for setting up displays at shopping centres, nurseries and libraries. She also gave talks to schools, church groups and garden clubs. No opportunity was missed to further the cause of her beloved birds.

All of this was fitted in with her work as a twice-weekly volunteer in the Ornithology Department of the Museum of Victoria. She stayed there for sixteen years.

As a delegate for BOCA she attended meetings of the Department of Conservation, Forests and Lands. She was invited, as a lay person, to the Royal Melbourne Institute of Technology Experimental Ethics Committee, and chaired the Roadsides Conservation Committee.

During discussions between the Japanese and Australian governments, when they were putting into place a scheme to provide protection for migratory birds, Ellen was a non-governmental delegate, contributing her extensive and practical expertise. During the 1970s she was a BOCA representative at a series of lengthy discussions with the Victorian Fisheries and Wildlife Division. These led, in 1981, to the Land for Wildlife project. To be able to display the Land for Wildlife logo, interested property owners were required to fulfil certain requirements, such as providing habitat for birds and other wildlife. Today, thousands of property owners participate in this scheme, and of all Ellen's achievements this gave her the most pride.